Canada's Share of the North American Automotive Industry: An Ontario Perspective

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Ministry of Treasury
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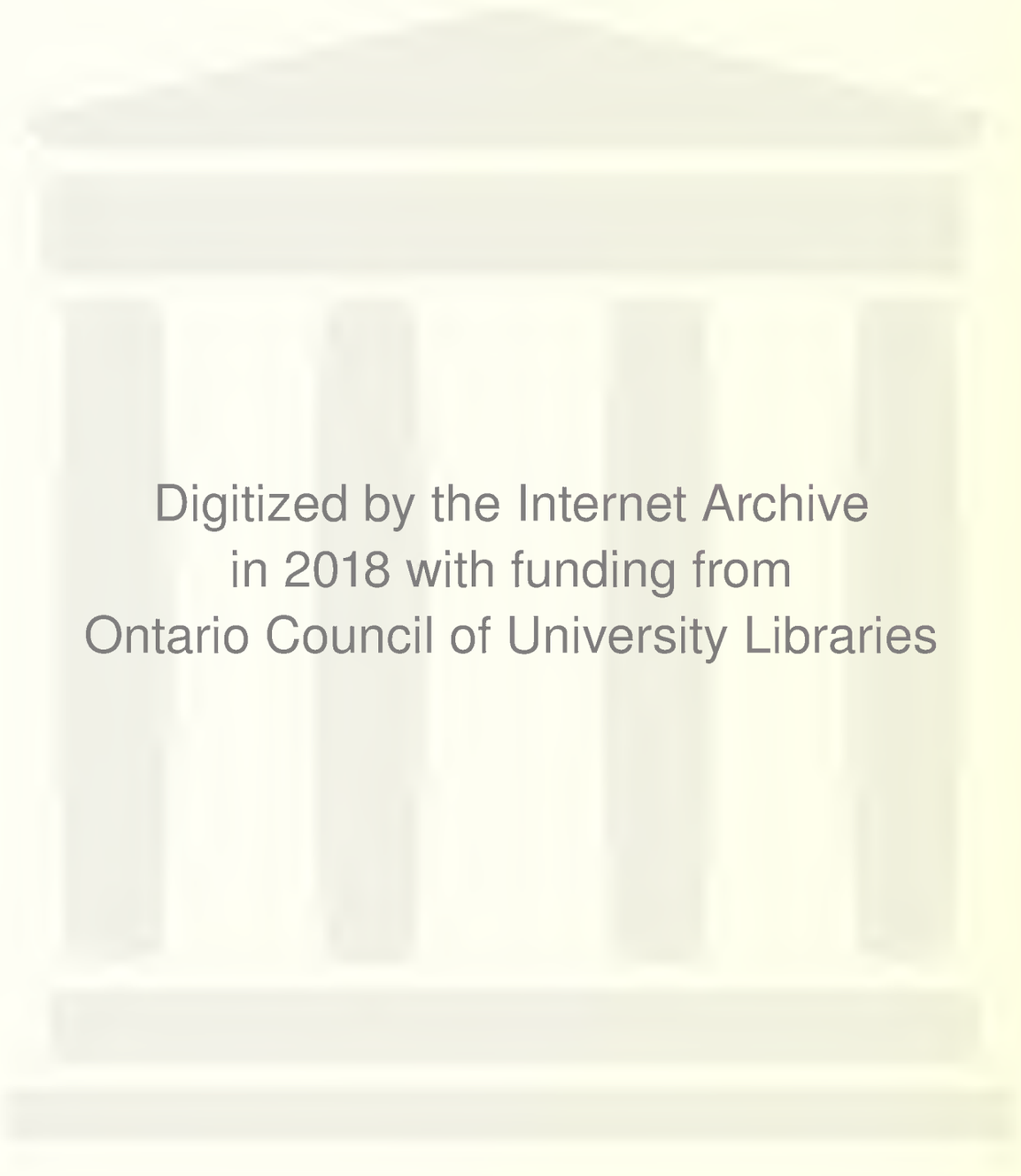

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SUMMARY

Canada's Share of Automotive Industry Activity

. Canada's share of the North American retail auto market has increased significantly since 1972 to an average of better than 9 per cent in the past five years.

. Industrial activity as measured by employment, value added, and investment has consistently failed to keep pace with this improved market position. As a result, Canada has less than a fair share of each.

. Current production activity in Canada is more than 20 per cent below that which would be justified by its market share.

. Canada's significant deficit in auto trade has occurred because the industry failed to match an improved market share with increased domestic production.

. Canadian parts activity is significantly below a "fair share".

Performance Targets

. A "fair share" output target for the Canadian industry, implicit in the auto agreement, would require a production level consistent with the market share. This implies a neutral trade balance.

. The industry should also have a structural target which would require a mix of assembly and parts activity equal to the North American average.

. A "fair share" research, design and development target would require that Canada be allocated R, D & D jobs and expenditure proportionate to its market share.

. In 1976, attainment of all three targets would have implied an additional 25,000 jobs, $866 million additional net investment and an additional $200 million in research and development expenditures.

Monitoring

. There exist differing opinions on the statistical basis for monitoring North American auto industry activity. Therefore, statistical concepts and definitions jointly accepted by Statistics Canada and the United States Department of Commerce are essential.

. Effective monitoring cannot be accomplished by the use of ad hoc definitions agreed upon for convenience; significant new research is required to ensure that future analyses take into account the statistical complexities outlined in this paper. These objectives could best be accomplished in the context of an ongoing monitoring program, working from a restructured data base.

Current Industry Performance

. Production of automobiles has recovered from a cyclical downturn in 1975, with particular strength in commercial vehicles.

. Employment has also recovered and is now close to peak 1973 levels.

. Retail sales in Canada were soft in 1977, with only modest increases over the previous year. Sales of passenger cars remain below 1975 levels.

. The automotive trade balance deteriorated slightly in 1977 compared with a year earlier. The net deficit of $1.1 billion was better than in 1975, however, with an improved position in assembled vehicles offsetting a record parts deficit.

. The spread between Canadian and U.S. factory list price widened slightly in 1977.

. Productivity in Canada, as measured by the value of output relative to labour input, remains 15-18 per cent below the U.S. in assembly and 10 per cent below the U.S. in parts.

INTRODUCTION

The performance of the automotive industry is of vital concern to Ontario. The industry is the province's largest direct employer, and is a major market for the products of a number of other industries. Directly and indirectly, the auto industry accounts for one in every six jobs in Ontario.

Since the implementation of the Canada-United States automotive agreement in 1965, the industry has grown rapidly. This has been not only because of the effects of the auto agreement but also because of significant growth in consumer demand. Expansion in the Canadian market has not been altogether orderly, however, because of the extreme sensitivity of new automobile sales to economic conditions beyond the control of the industry. Moreover, the industrial structure of automobile manufacturing in Canada has shifted, with an increasing specialization in completed vehicles and a relative decline in parts activity.

Technological changes have been forced on the industry by new regulations governing fleet fuel consumption. The size and weight of the average vehicle will have to be reduced substantially in the next five to seven years. This development will generate a sustained period of unprecedented technological change.

Against this background, a substantial Canadian deficit in Auto Pact trade has developed, calling into question the extent of Canada's benefits under the agreement. The observed increase in the size of the industry does not necessarily imply that Canada is

receiving a fair share of income and jobs from the auto industry or that the type of growth has been appropriate to Canada's long term industrial vitality.

This paper has four objectives. First, it reviews the performance of the industry with particular reference to the period of economic recovery since 1975. A number of continuing problems are identified. Second, the performance of the industry is evaluated in terms of Canada's share of overall automotive activity compared with the size of the domestic market for automotive products. Third, it reviews recent government action to deal with the problem. Finally, the role of the Ontario and federal governments in ensuring optimum performance and benefits for Canadians from our participation in the Auto Pact is reviewed.

PERFORMANCE REVIEW

Production

In 1977, vehicle production in the North American automotive industry exceeded 14.5 million units. The industry not only has recovered from its low levels of 1975, but has responded to energy conservation concerns with a massive down-sizing of their product. In Canada, much of the production growth over the last two years has occurred in commercial vehicles, the output of which grew by over 20 per cent in 1977 and 32.5 per cent in 1976. In neither country has passenger car production yet repeated the record performance of 1973.

MOTOR VEHICLE PRODUCTION
CANADA & UNITED STATES
(Thousands of units)

Table 1

	Canada		United States	
Year	Passenger Cars	Commercial Vehicles	Passenger Cars	Commercial Vehicles
1971	1,083.2	263.6	8,583.7	2,088.0
1972	1,154.5	319.9	8,828.2	2,482.5
1973	1,227.5	347.4	9,667.1	3,014.4
1974	1,165.6	361.7	7,324.5	2,746.5
1975	1,044.8	379.2	6,716.9	2,269.6
1976	1,137.3	502.8	8,497.9	2,993.4
1977	1,162.5	612.9	9,250.3	3,479.0

Source: Statistics Canada; U.S. Dept. of Commerce; and Automotive News.

Employment

Reflecting the upturn in production activity, employment has been on the rise in both Canada and the United States. Preliminary data indicate that last year employment in the automotive industry in both countries reached levels close to their 1973 highs. In Canada, employment has been equally divided between the assembly and parts sectors. In the United States, about 65 per cent of industry employment was in the parts industry.

AUTOMOTIVE EMPLOYMENT
CANADA & UNITED STATES
(Thousands of employees)

Table 2

Year	Canada			United States		
	Parts	Assembly	Total	Parts	Assembly	Total
1972	46.2	44.0	90.2	622.4	380.0	1,002.4
1973	52.8	46.8	99.6	690.2	413.2	1,103.4
1974	49.6	49.4	99.0	639.9	358.7	998.6
1975	42.6	45.3	87.9	564.8	316.5	881.3
1976	47.7	47.1	94.8	636.3	363.3	999.6

Source: Statistics Canada and U.S. Dept. of Commerce; and Ontario Treasury Estimate.

Note: For a full description of the derivation of employment statistics, see Appendix I.

Retail Sales

Retail sales of commercial vehicles in Canada and the United States continue to be strong. Commercial vehicle sales in Canada increased for the sixth consecutive year while in the United States they exceeded 3.3 million units, a new record.

North American passenger car sales in Canada remained soft following the high growth years of 1971 through 1975. In the United States, however, consumers have returned to the market for a second year.

NORTH AMERICAN TYPE MOTOR VEHICLE RETAIL SALES
CANADA & UNITED STATES
(Thousands of units)

Table 3

	Canada		United States	
Year	Passenger Cars	Commercial Vehicles	Passenger Cars	Commercial Vehicles
1971	592	147	8,681	2,011
1972	654	190	9,327	2,486
1973	783	235	9,676	2,916
1974	797	288	7,454	2,512
1975	836	310	7,053	2,249
1976	793	331	8,611	2,944
1977	798	338	9,104	3,352

Source: Statistics Canada; U.S. Dept. of Commerce; and Automotive News.

Relative Prices of Automobiles

A major Canadian objective in entering into the Auto Pact was to lower the cost of vehicles to Canadian consumers. At the outset, there was a significant price difference on most models. One measure of the success of the Pact is the narrowing of the factory price differential for similar cars sold in Canada and the United States during the intervening decade. Price controls in Canada accelerated this process in 1976, although prices in Canada moved up somewhat faster than in the United States in 1977.

PRICE DIFFERENTIALS, CANADA AND UNITED STATES
(Per Cent Difference in Factory List Prices, National Currencies) Table 4

Year	Lower Priced*	Medium Priced**	Higher Priced***
1965	n.a.	18.5	41.7
1972	8.7	10.9	13.6
1973	9.2	11.2	14.9
1974	7.6	9.3	11.3
1975	2.9	6.4	9.5
1976	4.6	6.0	8.6
1977	5.3	6.5	9.4

*2 Door Sedan, Subcompact
**4 Door Sedan, 6 Cylinder
***8 Cylinder Hardtop

Source: Eleventh Annual Report of the President to the Congress on the Operations of the Automotive Trade Act of 1965, December 1977.

Productivity

Statistics for assembly facilities suggest a Canadian labour to output ratio some 15 - 18 per cent higher than that in the United States, although various studies have indicated that there is no differential in the efficiency of Canadian plants. In the parts sector, this measure of productivity is somewhat better but still 10 per cent less than in the United States. Moreover, unlike assembly, the Canadian parts industry has experienced relatively healthy and steady improvement in its productivity growth performance in comparison with the United States.

PRODUCTIVITY PERFORMANCE IN THE AUTOMOTIVE INDUSTRY SINCE 1972 — Table 5

Year	Canada		United States	
	Assembly	Parts	Assembly	Parts
1972	100.0	100.0	100.0	100.0
1973	106.4	102.3	107.6	105.4
1974	128.7	108.9	98.5	108.2
1975	124.6	126.4	110.0	125.4
1976	129.3	151.0	138.9	145.5

Note: Productivity = Manufacturing Value Added per Production Worker, 1972=100.

Source: Ontario Treasury.

Automotive Trade

A major structural problem facing the industry is Canada's significant automotive trade deficit and, in particular, the increasing deficit in auto parts. While the overall deficit has declined from its 1975 peak, it remains the principal indicator of weakness in the Canadian industry as a whole.

Table 6 shows that, in 1971, Canada experienced an overall Auto Pact trade surplus of $230 million. By 1975, this had deteriorated to a $1.9 billion deficit. This deficit has subsequently been reduced to just over $1 billion in 1977.

Moreover, for the first time, Canada's parts deficit under the Auto Pact has exceeded $3 billion. This is an increase of over $2 billion since 1971 and occurred despite a growth in parts exports which averaged 17 per cent per year.

CANADIAN AUTOMOTIVE TRADE
WITH THE UNITED STATES
($ Millions)

Table 6

	1971	1972	1973	1974	1975	1976	1977
Canadian Imports							
Assembled Vehicles	1,326	1,554	2,082	2,531	3,126	3,291	3,948
Parts & Accessories	2,484	2,923	3,645	4,111	4,696	5,589	7,000
Total	3,810	4,477	5,727	6,642	7,822	8,880	10,948
U.S. Imports							
Assembled Vehicles	2,536	2,752	3,060	3,407	3,790	4,774	5,996
Parts & Accessories	1,504	1,800	2,239	2,017	2,113	3,105	3,865
Total	4,040	4,552	5,299	5,424	5,903	7,879	9,861
Balance of Trade							
Assembled Vehicles	+1,210	+1,198	+978	+876	+664	+1,483	+2,048
Parts & Accessories	-980	-1,123	-1,406	-2,094	-2,583	-2,484	-3,135
Total	+230	+75	-428	-1,218	-1,919	-1,001	-1,087

Source: Statistics Canada.

The statistics in Table 6 give the most complete and accurate figures available for automotive trade between Canada and the United States. Prior to 1970, a number of problems arose when each country seemed to use different trade statistics in their analysis. A series of consultations in 1970 between government statistical experts in both the United States and Canada led to agreement that a cooperative effort was necessary to prepare a complete accounting of trade under the automotive agreement. In addition, a joint Canada-U.S. committee studying overall trade statistics found that a substantial amount of automotive exports are never reported, because of slippages in submission and collection of documentation.[1] Agreement was reached by both countries to use their own import statistics to report automotive imports and the other country's import statistics to report automotive exports.

1. The Reconciliation of U.S.-Canada Trade Statistics 1970, A Report by the U.S.-Canada Trade Statistics Committee, published jointly by Statistics Canada, the U.S. Dept. of Commerce and the U.S. Bureau of the Census.

Recently, however, an additional problem has been raised with respect to automotive trade activity. Some contend that Canada currently has a substantial trade surplus with certain third countries in automotive products that would not have existed in the absence of the Auto Pact. A portion of this trade is simply re-exports of parts imported from the United States. Therefore, it is proposed that this trade be reflected in Auto Pact statistics. The suggested amendment for 1976 would be as follows:

Reconciled U.S.-Canada Trade Deficit	$1,001 million
Less Third Country Auto Pact-Related Surplus	$ 450 million[1]
Canada's World Auto Pact-Related Deficit	$ 551 million

Very serious statistical problems are inherent in any attempt to make such an adjustment.

- It is not possible to distinguish between so called Auto Pact related trade with third countries and non Auto Pact related trade with these countries. It is known, however, that a substantial portion is not Auto Pact-related. This makes the estimate, regardless of the statistical base, hazardous.

- The adjustment shown here is available for one year only. To be able to determine trends in the trade deficit, essential for evaluations of overall trade performance, an historical series is necessary.

- Attempts to make adjustments to auto trade statistics based on published Canadian and U.S. trade data with third countries are subject to all the problems encountered by the U.S.-Canada Joint Committee on Trade Statistics.

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1. Estimates by the Canada Department of Industry Trade and Commerce on the basis of information gathered from the motor vehicle manufacturers.

The underlying assumption of the third country trade adjustment is that very little of this trade would accrue to Canada in the absence of the Auto Pact. It is reported that most of this activity is classified as completely knocked down vehicles (CKD's). Canada first began shipping CKD's in the 1930's, and prior to the Auto Pact a significant part of our trade with countries other than the U.S. was of this type. It is not possible, however, because of trade data reclassifications in 1965 to compare third country trade before and after the implementation of the Auto Pact. This makes it difficult to evaluate the effect of Auto Pact in this regard.

It has also been argued that the published Canada-U.S. auto trade deficit should be adjusted to take account of the automotive parts aftermarket trade. In 1976, this account is estimated to have been in a deficit position of $256 million. Since aftermarket parts are not included under the terms of the Auto Pact, adjustment for this would reduce the overall trade deficit by that amount. There are strong economic arguments for rejecting this adjustment:

- The aftermarket deficit reflects the overall structure of the industry as it has developed under the Auto Pact. Therefore, it cannot be isolated from an assessment of the North American industry performance. Aftermarket parts must be included.

- The aftermarket adjustment might be valid in assessing industry performance under the terms of the Auto Pact. This paper, however, is not a reassessment of the automotive agreement itself. Rather, it focusses on the distribution of all automotive activity within the North American market.

In conclusion, the proposed adjustments to the trade statistics are themselves subject to error and misinterpretation. Nonetheless, the size of the automotive deficit with the United States is probably

overestimated in the published figures. Even if these adjustments were made, however, the size of the deficit would remain a serious problem. Moreover, none of the conclusions of this paper are based on the precise size of the deficit. Indeed, the fair share concepts developed in later sections are not based on the trade statistics, although the basic deficit in the trade data does support the conclusions derived from the approach used in this study.

The trade deficit that Canada has experienced over the past five years can be considered as a cumulative loss. Therefore, even if the deficit were to be erased in the next few years, although forecasts do not suggest this is likely, the Canadian trade balance would need to be in surplus by an equivalent amount to offset the historical loss.

The persistence of the deficit over the past five years, coupled with federal government projections[1] of a continued growth in this deficit, raises serious questions about the allocation of future automotive activity to Canada. This is especially a concern on the eve of a major investment program for the North American industry. This paper addresses the question of what would constitute a "fair" distribution of automotive activity in North America between Canada and the United States. In doing so, it does not argue for a distortion of basic economic activities, but for recognition of a formula for fairly sharing the benefits of such activities.

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1. The Automotive Industry in Canada, Canada Department of Industry Trade and Commerce, p. 10.

THE FAIR SHARE CONCEPT

The mixed performance of the Canadian automotive industry in recent years has been documented in the previous section. One fact is clear: there has been a deterioration in the underlying trend of Canada's trade balance in automotive products with the United States.

Despite this deficit, some measures of relative activity in the two countries suggest that Canada is receiving more than its share of automotive activity. In particular, Canada's net export of completed automobiles to the United States is often construed to mean that Canada enjoys a relative advantage. Moreover, that the industry has grown more rapidly in Canada than in the United States since 1965 is sometimes taken as proof that Canada has shared more than equally in the benefits of the Auto Pact.

Whether the automotive industry is fairly distributed between the two countries cannot be determined by these indicators alone. The distribution of the total benefits of the North American industry requires an analysis of the broader aspects of the industry's economic impact.

The determination of Canada's fair share of economic activity requires a definition of the term "fair". The spirit of the auto agreement suggests that relative shares of economic activity should be judged with respect to market shares. Thus, a "fair" share of economic activity for Canada requires production growth that moves in pace with domestic consumer demand. Otherwise, growing trade deficits are inevitable.

Structure of the Industry

The analysis of the automotive industry is complicated by the fact that international trade takes place in components as well as finished products. Vehicles completed in Canada contain a mixture of Canadian made and imported components. Furthermore, the Canadian parts industry uses both Canadian made and imported components as inputs. Under these circumstances, it is not surprising that comparisons of individual statistics tend to be misleading. Any comparisons of the indicators of industrial activity should take account of the structural differences of the industry in the two countries.

Market Shares

The completed automobile incorporates most of the output of the parts industry, and any attempt to combine measures of both types of production results in double counting. It is, therefore, the sale of finished vehicles alone which determines market shares. Although it would be desirable to qualify this definition by taking account of the "aftermarket" for parts, the limited data available suggest that these sales are not distributed differently than new vehicles sales.

Vehicle sales data are not available for the United States in value terms. Use of a unit base of comparison has the weakness that retail sales in the United States are more heavily concentrated in the larger, more expensive product lines. To a certain extent, however, this bias is offset by the fact that higher value trucks make up a larger portion of sales in Canada.

RETAIL SALES OF NORTH AMERICAN MOTOR VEHICLES
CANADA & UNITED STATES
(Thousands of units)

Table 7

Year	United States	Canada	Total	Canadian Percentage Share
1965	10,302	754	11,056	6.8
1966	9,996	758	10,754	7.0
1967	9,092	738	9,830	7.5
1968	10,432	779	11,211	6.9
1969	10,399	788	11,187	7.0
1970	8,866	622	9,488	6.6
1971	10,692	739	11,431	6.5
1972	11,813	844	12,657	6.7
1973	12,592	1,018	13,610	7.5
1974	9,966	1,085	11,051	9.8
1975	9,302	1,146	10,448	11.0
1976	11,555	1,124	12,679	8.9
1977	12,456	1,136	13,592	8.4

Source: Statistics Canada; U.S. Dept. of Commerce.

Vehicle sales in both countries grew at similar rates from 1965 until 1973. Comparable cyclical patterns are also evident. However, sales followed different trends during the recession of 1974-1975 which was more severe in the United States than in Canada. As a result, Canadian sales continued to increase while those in the U.S. fell substantially. Economic recovery in 1976 and 1977 brought improved sales in the U.S. but total sales volume remained below 1973 levels.

Other indicators of comparative economic activity in the auto industry must be judged against the relative market performance. Indeed, it is demonstrated below that Canada's poor trade balance in recent years has resulted from the failure of the industry to respond to Canada's relatively larger share of the North American market.

Indicators of Industrial Activity

Several measures can be used to analyze the allocation of industry activity between Canada and the United States including employment, factory shipments, value added, investment and import/export measurements. The approach here will be to compare the distribution of benefits with the "fair" distribution implied by shares of retail sales.

A number of adjustments were made to the United States Standard Industrial Classification (SIC) in 1972. These changes resulted in improved comparability of U.S. and Canadian data for the period since 1972, but they are not useful for comparisons with the prior period. Since the focus here is on the concept of a fair share of industrial activity, the more recent data are most relevant. It is worth noting, however, that most published studies of the industry compare activity only for the categories of production for which continuous data are available from 1965.

The international comparisons in this study are based on SIC comparability tables published by the Government of Canada, Department of Industry, Trade and Commerce. The conversions used are shown in Table 8.

STANDARD INDUSTRIAL CLASSIFICATION EQUIVALENTS, CANADA AND UNITED STATES — Table 8

Canada		United States	
Industry Name	SIC	Industry Name	SIC
Motor Vehicles	323	Motor Vehicles and Car Bodies	3711
Motor Vehicle Parts & Accessories	325	Motor Vehicle Parts, Accessories	3714
		Automotive Stampings	3465
		Carburetors, Pistons, Rings, etc.	3592
		Vehicular lighting equipment	3647
		Engine electrical equipment	3694

Source: Canada, Industry, Trade and Commerce, "Comparison of Canadian (1970) and United States (1972) Industrial Classification of Manufacturing Industries" Ottawa 1975.

In addition, the U.S. employment data have been adjusted to include wholesaling activities of the vehicle manufacturers. While the corresponding Canadian employees are included in the appropriate Census of Manufacturers category, U.S. data includes these employees in Sales Departments of Manufacturers under Wholesale Trade.[1]

Employment

Table 9 shows total employment and production employment for both Canada and the United States. Shares of both types of employment are compared with the market shares derived earlier.

1. A full discussion of these adjustments to employment data is included in Appendix I.

Canada's share of employment has been lower than its market share since 1974. The automotive industry in Canada, however, is more labour intensive than in the United States, and a fair share of overall activity does not necessarily imply an employment share equal to the market share. Moreover, the total employment share is slightly higher than production employment in all years because a somewhat larger proportion of Canadian automotive industry employees are involved in non-production activities. Thus, the total employment data reflect the impact of a more integrated marketing structure and higher administrative overhead in the Canadian automotive manufacturing industry. The proportion of employees involved in these activities is smaller in the United States.

AUTOMOTIVE INDUSTRY EMPLOYMENT
CANADA & UNITED STATES

Table 9

Year	Canada		United States		Canadian Share		
	Total	Production	Total	Production	Total Employment	Production Employment	Retail Market
	(000's)		(000's)		(Per cent)		
1972	90.2	68.5	1,002.4	798.6	8.2	7.9	6.7
1973	99.6	76.9	1,103.4	885.1	8.3	8.0	7.5
1974	99.0	76.3	998.6	789.1	9.0	8.8	9.8
1975	87.9	66.6	881.3	695.5	9.1	8.7	11.0
1976	94.8	73.6	999.6	800.7	8.7	8.4	8.9

Source: Statistics Canada; U.S. Dept. of Commerce.

Employment shares can also be viewed from the perspective of the distribution of labour incomes. The employment share data shown above do not take into account lower average total compensation in the Canadian industry. In 1975, the latest year for which such data is available, despite a higher ratio of labour content in Canadian automotive output, Canada's share of the total wage and salary bill for the industry was 8.3 per cent, compared with a 9.1 per cent share of total employment and an 11 per cent share of the retail market.

Production and Value Added

Use of relative shares of factory shipments in analyzing the North American automotive industry can be misleading since they incorporate the value of inputs, and double counting results. For this reason value added, a measure of the value of actual in-plant activity, is a much more appropriate statistic.

AUTOMOTIVE ASSEMBLY AND PARTS MANUFACTURING
VALUE ADDED, CANADA AND UNITED STATES — Table 10

Year	Value Added*		Percentage Share	
	Canada	United States	Value Added	Retail Market
	($ Million Cdn.)		(per cent)	
1972	1,773.4	25,380	6.5	6.7
1973	2,065.7	29,835	6.5	7.5
1974	2,365.6	25,792	8.4	9.8
1975	2,179.4	26,008	7.7	11.0
1976	2,668.7	36,054	6.9	8.9

*Value added in production activity. Data for the United States are for total activity, although the nature of U.S. data suggests this to be virtually all production value added. See Appendix I for a discussion of the problem.

Source: Statistics Canada; U.S. Department of Commerce; and Ontario Treasury.

Table 10 illustrates that Canada's share of total North American value added has been consistently lower than the market share. The failure of the industry to respond to the increasing Canadian market share has resulted in an overall level of automotive production more than twenty per cent below the fair share level. Table 11 clearly illustrates the increasing spread between Canadian production and market shares in the North American industry.

CANADIAN PRODUCTION AND MARKET SHARE — Table 11

Year	Share of Value Added (%)	Market Share (%)	Differences (%)	Dollar Value of Share Differences ($ Million)
1972	6.5	6.7	-0.2	54.3
1973	6.5	7.5	-1.0	319.0
1974	8.4	9.8	-1.4	394.2
1975	7.7	11.0	-3.3	930.2
1976	6.9	8.9	-2.0	777.6

Source: Tables 7 and 10.

Investment

There are a number of reasons for being interested in the rate of capital investment. Investment in new plant and equipment is a prerequisite if output and employment are to increase to match increases in consumer demand and if the industry is to remain efficient and competitive. Moreover, new investment has indirect employment and income generating effects.

What constitutes a fair share of investment is, however, not obvious. Since the age and structure of the capital stock are substantially different in Canada than in the United States, there is no reason to expect that the rate of investment should bear any particular relationship to market share, particularly in the short run.

A reasonable investment criterion is that it should be adequate to maintain production at the fair share level. It does not appear that this has been the case in Canada in recent years.

The Canadian parts sector is disproportionately small. It is also true that the parts sector is more capital intensive than the assembly sector. Therefore, it has been possible for the Canadian industry to increase output at relatively modest capital cost by concentrating on assembly. The consequence of this has been a decline in the relative size of the parts industry.

The share of fixed capital formation in the Canadian automotive industry going to the parts sector has declined steadily from about 65 per cent in 1973 to less than 49 per cent in 1977. At the same time, the proportion of net capital stock in the Canadian parts sector has fallen from 62.2 per cent to 60.8 per cent.[1] During the period 1972 to 1977, the proportion of total North American auto industry investment occurring in Canada has averaged 5.4 per cent. These data suggest that recent rates of investment in the Canadian industry have been too small in terms of maintaining an adequate level of output and competitiveness and a reasonably balanced industry structure.

Canada's Share of Total Activity

The foregoing analysis has demonstrated that total economic activity generated by the auto industry in Canada has been significantly less than the "fair" share which is implied by the spirit of the automotive agreement and Canada's contribution to North American consumer demand. Clearly, Canada has shared in the benefits of the Auto Pact. It is, nevertheless, clear that additional production facilities will be required in Canada if an equitable share of these benefits are to be realized.

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1. Statistics Canada, unpublished data.

GOVERNMENT ACTION

In April 1976, the Ontario Government outlined a number of serious longer term problems in the Canadian automotive industry. This paper, "Performance Under the Auto Pact: An Ontario Perspective", showed that:

- the competitive position of Canada's assembly industry had slipped rapidly behind the United States;
- capital spending by Canadian assembly facilities had lagged considerably behind U.S. levels in the early 1970's, while in the parts sector the investment performance had begun to deteriorate;
- the allocation of assembly activity to Canada did not provide all the benefits to Canada that have been commonly asserted; and
- Canadian parts producer penetration of the North American market has not been sufficient.

This study was followed by a series of meetings between the Minister and officials in Ontario's Ministry of Industry and Tourism and representatives of the major interests in Ontario's automotive sector. These discussions have focused on the needs and proposals of all concerned to achieve an improved balance in auto trade.

In addition, many of the problems have also been recognized by the Government of Canada. In April 1977, a study entitled Review of the North American Automotive Industry was tabled in the House of Commons by the Minister of Industry, Trade and Commerce. While recognizing significant increases in investment, employment and productivity in the last decade, the review identifies and analyzes a series of problem areas including lagging Canadian productivity and capital investment, and inadequate auto parts activity.

The federal government study identified the "in-house" activities of the "Big Four" auto makers as being the principal source of much of the parts deficit. In 1975, of an original equipment deficit of $2.0 billion, over $1.7 billion was accounted for by the "in-house" transfers of the four major producers.

In addition, the federal report criticized the level of research and development in Canada. For the period 1971-1975, the major motor vehicle manufacturers expended over $2 billion annually for research and development while expenditure by the assembly industry in Canada has been minimal. At the same time, the auto maker subsidiaries in Canada have contributed in excess of $300 million annually in recent years to the research and development accounts of their parent corporations.

Another paper entitled The Automotive Industry in Canada, released by the Canadian Department of Industry Trade and Commerce, reaches similar conclusions. This study predicts that the higher rate of market growth in Canada will continue into the mid-1980's. It further predicts a trade deficit of $2.4 billion (in 1976 dollars) by 1985 if Canadian production were to continue to increase at the North American growth rate.

Another observation contained in the Industry Trade and Commerce paper is that the continued reliance on labour intensive activity could leave Canada vulnerable to developing Third World competition. The need for additional capital investment to achieve a better

balance of automotive production is also recognized. Federal government proposals for action on these issues have included the following:

- immediate action to enlist the cooperation of the vehicle manufacturers to achieve a better balance of production and consumption in Canada while the requirement exists for additional spending to meet energy, environmental and safety regulations;
- action to achieve a better balance of capital intensive and new technology work in Canada;
- provisions to enhance the ability of independent suppliers of parts to counter foreign competition, avoid technological obsolescence and exploit export opportunities;
- participation in a dialogue with U.S. officials with a view to achieving improved cooperation in this sector; and
- achievement of a better regional distribution of automotive production in Canada.

To date, efforts to implement these proposals have met with limited success. The individual producers are faced with a large choice of potential site locations, many of which include substantial "up front" tax and other locational incentives. The subsidy approach to attracting new investment in this industry is an increasingly expensive policy, and it is not clear that such an approach would be beneficial to Canada and Ontario or that it has the permanent attractiveness of a conducive investment environment and a competitive long term tax structure.

PERFORMANCE TARGETS FOR THE INDUSTRY

Earlier analysis indicated that the recent performance of the automotive industry, although good by historical standards, has not been good enough to ensure for Canada a fair and equitable share of expanding markets. Canadian performance falls short of a fair share in overall production, parts production, investment, trade balance and employment.

Canada's failure to achieve a "fair share" of auto industry production is reflected in the enormous and persistent trade deficit. Of course, due to transfer pricing problems, a fair share of total activity would not necessarily imply a neutral trade balance. Aside from problems of estimation, however, the two objectives are closely related, as shown in Table 12.

MARKET AND PRODUCTION SHARES AND THE TRADE BALANCE IN AUTOMOTIVE PRODUCTS — Table 12

Year	Share of Value Added (%)	Market Share (%)	Share Difference (%)	Trade Balance ($ Million)
1972	6.5	6.7	-0.2	+75
1973	6.5	7.5	-1.0	-428
1974	8.4	9.8	-1.4	-1,218
1975	7.7	11.0	-3.3	-1,919
1976	6.9	8.9	-2.0	-1,001

Source: Tables 4, 7 and 10.

Output Target

An output target could be specified in terms of either the trade balance or a fair share of activity. The latter concept is more useful here, however, since the employment and investment consequences are readily derived.

To meet a "fair share" target, Canada would require a share of value added which approximated its market share. In 1976, this would have implied an additional $778 million in value added. Consequently, overall auto trade would have been close to a balance.

Structure Target

The structure of the total North American automotive industry is roughly balanced, with third country trade in parts negligible. In North America, parts value added accounted for 56 per cent of total value added in the industry. In contrast, the value of parts activity in Canada represented only 51 per cent of the total.

A structural target for the Canadian auto industry could be that Canadian parts activity match the North American balance. This proportion would not be constant over time, of course, since technological change or a shift in consumer preferences could easily change the proportion of value added in the assembly process. Nonetheless, with appropriate adjustments for market or technological differences in the two economies, this is a realistic long run target.

The achievement of this objective would require that the additional value added called for under the output target be distributed heavily in favour of the parts industry. Specifically, the requirements for 1976 would have been:

additional parts value added	$564 million
additional assembly value added	$214 million
total value added	$778 million

Research, Design and Development Target

The long term viability of Canadian industry depends upon technological innovation. Canada, however, has a major shortfall of auto research, design and development jobs. Moreover, Canadian foreign payments for research and development have averaged $230 million over the past 3 years. Therefore, the allocation of North American research, design and development jobs and expenditures should be based on a "fair share" target. Given that total North American research and development expenditures are approximately 2.3 billion dollars, Canada's share should be 205 million dollars.

Implications for Employment and Investment

By making a number of simplifying assumptions, the implications of these targets for employment and investment can be derived. Based on the average number of jobs per million dollars of value added in parts and assembly in 1976, achievement of both the output and structure targets in that year would have required the following additional employment:

additional parts employment	16,151
additional assembly employment	5,919
additional R, D & D employment	2,500
total employment	24,570

Similarly, new investment implied by these targets can be estimated on the basis of the 1976 ratio of net capital stock to value added. The estimates are as follows:

additional parts investment	$697 million
additional assembly investment	$169 million
total investment	$866 million

This would be the additional net investment required to bring Canadian production and industrial structure up to the targets in 1976. An appropriate Canadian share of additional industry expenditures for technological change would also be required.

MONITORING THE AUTO PACT

This study has demonstrated that, by most measures, Canada is not receiving a fair share of the total activity of the North American automobile industry. In recent years, Canada's contribution to the retail market for automobiles has been consistently greater than its share of production.

This conclusion will not be accepted universally. There are some other views of the industry which may be supported by published statistics. For example, The Automotive Industry in Canada released by the Canadian Department of Industry Trade and Commerce shows Canadian employment shares which are significantly larger than the ones calculated here. Moreover, it has been suggested that the published trade statistics may overstate Canada's deficit under the Auto Pact.

This confusion stems from two fundamental statistical difficulties. First, there is no generally accepted definition of the automotive industry. Moreover, comparability problems between the United States and Canadian SIC categories complicate the use of published statistics regardless of the industry definition. Second, the highly integrated, multinational structure of the automobile manufacturing companies creates valuation problems, particularly with respect to trade statistics. The transfer prices used for international shipments between divisions of the same company are not market determined, and there is considerable speculation on the bias which might be introduced.

In the absence of a consensus on appropriate statistical concepts, it is not surprising that it is possible to document diverse points of view using "official" published data. To add to the confusion, few of the previously published studies on the automotive industry have acknowledged the underlying statistical assumptions. In some cases, working definitions have been arbitrarily chosen on the basis of data availability, and the results have been presented without qualification.

In contrast, the statistical comparisons used here have been developed from an extensive analysis of the underlying concepts and definitions. The details of this analysis are presented in Appendix 1. Although the methodology in this paper has been chosen in order to minimize bias in international comparisons, it is not possible to achieve complete accuracy using available data.

It is clear that better information about this industry is required on a continuing basis. As a prerequisite, statistical concepts and definitions jointly accepted by Statistics Canada and the United States Department of Commerce are essential. This cannot be accomplished by the use of ad hoc definitions agreed upon for convenience; significant new research is required to ensure that future analyses take into account the statistical complexities outlined in this paper. These objectives could best be accomplished in the context of an ongoing monitoring program working from a restructured data base.

APPENDIX 1

APPENDIX 1

ANALYSIS OF STATISTICAL CONCEPTS

There are numerous statistical difficulties in comparisons of data for the automotive industries in Canada and the United States. In the United States, census data are published every five years,[1] and survey data are published annually.[2] In Canada, consistent census data are published every year.[3] Data from these sources have been used to develop employment and value added in Tables 2, 9 and 11 of this paper.

The most serious problem with this data is a difference in the determinants of manufacturing activity. In the United States, "manufacturing" is defined so as to exclude most non-manufacturing activity.[4] In Canada, data for non-manufacturing activity are included in the Census of Manufactures, although separately from data for manufacturing activity.

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1. U.S. Department of Commerce, 1972 Census of Manufactures, Washington, December 1974.
2. U.S. Department of Commerce, Annual Survey of Manufactures.
3. Statistics Canada, Annual Census of Manufactures.
4. See U.S. Department of Commerce, Annual Survey of Manufactures, 1976 General Statistics for Industry Groups and Industries, page 23, footnote 1, for a description of excluded activities.

Value Added

In Canada, "manufacturing value added" data are published as part of the annual Census of Manufactures. Only "total value added" data are published annually for the United States. However, since almost all non-manufacturing activity is already excluded by the U.S. census definition, the differences between published "total" and "manufacturing" data are likely to be quite small.

In 1972, the latest U.S. census year, non-manufacturing activity accounted for only seven-tenths of one per cent of total shipments. Consequently, the published "value added by manufacture" data in the U.S. are assumed in this study to compare to the Canadian "manufacturing value added".

Employment

In the case of automotive parts manufacturing, employment data for both Canada and the United States can be obtained from published sources. Manufacturing and non-manufacturing employment are included in the survey information for both countries.

The analysis of employment in the automotive assembly sector is not as straightforward. In Canada, employees of the automotive manufacturers engaged in distribution and merchandising

functions are included in the total employment of the manufacturers. In the United States, the corresponding employees are classified under motor vehicle wholesaling (SIC 5012) and lumped with wholesale trade data in the survey statistics. A subcategory for employment in "Manufacturers Sales Branches" is accounted for separately in census years. In 1967, there were 38,653 of these merchandising employees representing 12.0 per cent of total assembly employment.[1] The 1972 Census reported this category on a slightly different basis, but the proportion of total assembly employment remained stable at approximately 12 per cent. In this study, therefore, the total assembly employment data have been adjusted to reflect the 12 per cent wholesaling component. The published assembly employment, the estimated employment of manufacturers sales branches and revised total employment are shown in Appendix Table 1.

UNITED STATES AUTO ASSEMBLY EMPLOYMENT
(000's)

Appendix Table 1

Year	Published Assembly Employment (SIC 3711)	Estimated Employment Manufacturers Sales Branches	Total Employment
1972	339.2	40.8	380.0
1973	368.8	44.4	413.2
1974	320.2	38.5	358.7
1975	282.5	34.0	316.5
1976	324.3	39.0	363.3

Source: U.S. Department of Commerce, Annual Survey of Manufactures, and Census of Business, Wholesale Trade; and Ontario Treasury.

1. U.S. Department of Commerce, Census of Business, Wholesale Trade, 1967 and 1972.

SIC Comparability

The SIC categories used in this analysis were shown in Table 8. The selection of comparable classifications was hampered by problems in SIC categories in both Canada and the United States. Nevertheless, the definition of the industry used here has been chosen carefully in order to minimize the distortion caused by the problems.

As noted earlier, the primary source for the SIC comparisons was a paper published by the Canada Department of Industry Trade and Commerce. The total employment figures for 1972 in the Industry Trade and Commerce study are identical with those in this paper, and data for subsequent years have been calculated using the same industry definition.

This definition does not eliminate all of the SIC conflicts. There are two types of overlaps in the industry classifications accounted for in this study. First, some of the SIC categories included in this study as automotive also comprise some non-automotive activity. For example, some piston manufacturers produce both automotive and aircraft pistons. Second, automotive parts are manufactured in both countries by firms which are included in non-automotive SIC categories. Automotive windows made by non-specialized glass manufacturers are an example.

It has been alleged that the net effect of these overlaps is to underestimate Canada's share of total automotive industry activity. To test this hypothesis,other sources of information

were analysed. The primary source for this analysis was the Canadian - United States Standard Industrial Classification Convertibility Index published by Statistics Canada.

The SIC categories of Canada and the United States do not convert on a one for one basis.[1] In the case of automotive parts, the Canadian SIC 325 is listed by Statistics Canada as having ten related SIC categories in the United States. Four of these, two of which are shown as totally related, and two of which are listed as "most activities related", are included in the definition used in this study.

The remaining six U.S. classifications[2] are only partially related to the Canadian parts industry. An analysis of the non-automotive activity included in these was undertaken using the 1972 United States Census of Manufactures. Four of these United States industries include primarily non-automotive activity, and, therefore, were excluded from this analysis.

In the case of U.S. SIC 3592, (Carburetors, Pistons, etc.), non-automotive shipments were found to constitute a small part of the total industry activity and, therefore, this category was included

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1. The Statistics Canada Index states that "often a number of U.S. four-digit industries as a group will convert into a single Canadian three-digit class".

2. US Standard Industrial Classifications
   3231 Glass Products, Made of Purchased Glass.
   3493 Steel Springs, Except Wire.
   3592 Carburetors, Pistons, Piston Rings and Valves.
   3711 Motor Vehicles and Passenger Car Bodies.
   3825 Instruments for Measuring and Testing of Electricity and Electrical Signals.
   3829 Measuring and Controlling Devices, N.E.C..

in the automotive industry as defined here. The United States SIC 3711 (Motor Vehicles and Car Bodies) includes some parts activity. Since there is no objective method of separating this activity, the entire classification has been included in the assembly sector. This affects the division between parts and assembly but not the size of the overall automotive industry in the United States.

Appendix Table 2 shows the SIC categories included in the definition for automotive parts manufacturing in this study. The non-automotive component included in these SIC categories is not large enough to alter significantly the percentage shares shown earlier in this paper.

PARTS CLASSIFICATIONS INCLUDED IN THE U.S. INDUSTRY DEFINITION, 1972 SHIPMENTS — Appendix Table 2

Code	Industry Name	Total Shipments ($US Millions)	Non-Automotive Shipments ($US Millions)	Non-Automotive Share (Per Cent)
3592	Carburetors, Pistons, Rings & Valves	791.9	127.1	16.0
3647	Vehicular Lighting Equipment	358.1	41.0	11.4
3714	Motor Vehicle Parts & Accessories	19,417.0	79.2	0.4
3465	Automotive Stampings	5,286.0	0.0	0.0
3694	Engine Electrical Equipment	2,035.0	0.0	0.0

Source: United States Department of Commerce, Census of Manufactures 1972.

The Canadian Census of Manufactures does not provide sufficient detail to allow a similar estimate of the non-automotive activity included in the Canadian parts industry (SIC 325).

Statistics Canada does not classify shipments by end-use as does the United States Department of Commerce. The same types of bias, however, apply in Canada. Nonetheless, if indeed there were a significant amount of non-automotive activity included in SIC 325 then an overestimate of the Canadian share of total activity would result.

The second type of overlap, the automotive component of non-automotive industries, can be estimated for the United States but not for Canada. For the United States, an estimate of this component was calculated for 1972 by the Motor Vehicle Manufacturers Association of the United States (MVMA) using the Census of Manufactures.[1] The MVMA calculates that approximately $21 billion in automotive parts shipments were excluded from the automotive parts SIC category 3714. The associated employment was about 521,000. For 1972, 221,000 of these employees were accounted for in Table 2 of the present study. The remaining 300,000 employees, about 30 per cent of total included automotive employment, are excluded under the industry definition used here.

A thorough analysis of the limited data available for Canada does not suggest any reason to predict that the excluded employment in Canada would be significantly larger on a proportional basis. On the basis of this analysis, it was concluded that the industry definition used in this paper is the best possible.

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1. Motor Vehicle Manufactures Association of the United States Inc., Motor Vehicle Facts and Figures '76. Detroit, 1976.

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Ontario. Ministry of Treasury, Economics and Intergovernmental Affairs.

Canada's share of the North American automotive industry.